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March 20, 1995

VIA HAND DELIVERY
Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, NW
Washington, DC 20554

Re: Comments in ET Docket No. 94-32

Dear Mr. Caton:

Attached, please find an original and four copies of the Comments of Cornell University in response to the Commission's *Second Notice of Proposed Rule Making* in ET Docket No. 94-32 (Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use). If you have any questions regarding this matter, please contact the undersigned counsel.

Very truly yours,

Paul J. Feldman
Counsel for
Cornell University

MR:ik
Enclosure

cc: Dr. Willem Baan

BEFORE THE

FEDERAL COMMUNICATIONS COMMISSION

WASHINGTON, D.C. 20554

In the Matter of	)	
	)	
Allocation of Spectrum Below	)	ET Docket No. 94-32
5 GHz Transferred from	)	
Federal Government Use	)	

COMMENTS OF
CORNELL UNIVERSITY AND
THE NATIONAL ASTRONOMY AND IONOSPHERE CENTER

Cornell University ("Cornell") and the National Astronomy and Ionsphere Center ("NAIC"), which operates the Arecibo Observatory ("the Observatory") near Arecibo, Puerto Rico under the terms of a cooperative agreement with the National Science Foundation, hereby submit their comments in response to the Commission's First Report and Order and Second Notice of Proposed Rulemaking, FCC 95-47, released February 17, 1995 on the Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use ("R&O" and "NPRM").

I. Introduction

The R&O particularly recognizes the importance of the planetary radar operations at the Arecibo Observatory[1]. The 2390-2400 MHz and 2402-2417 MHz frequency bands being reallocated are adjacent to the 2370-2390 band used by radar astronomers for their observations at Arecibo. Unwanted emissions from users in these bands could interfere with the very weak return signals of the radar and effectively destroy the data. Therefore, Cornell and NAIC are pleased with the proposed allocations of the 2390-2400 MHz and 2402-2417 MHz bands as proposed in the Report and Order.

A primary status for the Amateur service in those bands is considered appropriate. NAIC is pleased to have spectral neighbors with whom few problems have

occurred and which have been solved amicably. Cornell and NAIC are also pleased with the secondary allocation of Part 15 devices for both bands. Any other fixed or mobile secondary service would likely have posed out-of-band interference for the operation of the planetary radar at the Arecibo Observatory.

Cornell points out that its earlier comments have been written in response to the NOI and an earlier NPRM in these procedings and at a time that it was unclear which services would be allocated to the two bands. At this point Cornell is less concerned about the threat for interference to the planetary radar operation at Arecibo because of the allocations decided on by the Commission. Cornell considers the Amateur and Part 15 devices to be the best choice for protecting the planetary observations and preserving the integrity of the allocation structure in these bands. Similarly, Cornell is presently less concerned about harmonic emissions of services in the 2412-2418 MHz band interfering with radio astronomy observations in the 4825-4835 MHz band.

In the following, Cornell and NAIC specifically provide comments on the questions posed in the NPRM concerning any restrictions to be placed on the use of the two bands by the newly allocated services.

II. Amateur Services in the 2390-2400 and 2402-2417 MHz Bands

In the past the Arecibo Observatory has had a minimum of conflicts with the Amateur service and these conflicts have always been solved amicably. The relation between the Observatory and the amateurs is very good and the Peurto Rico chapter of the ARRL does its best to coordinate and communicate with the Observatory staff. The Observatory will work together with the ARRL on advance coordination on actual use of frequencies within these bands. The Observatory trusts that any future conflicts involving out-of-band or spurious emissions from amateur operations within the 2390-2400 MHz band will be solved locally and in good faith between the Observatory staff and the local amateurs. Cornell hopes that the amateur community will not allocate high power systems within this newly allocated band.

[1] R&O at p 5. In Comments submitted by Cornell and CORF in response to the NOI in this proceeding, the significance of this band for planetary radar studies have been described extensively.

III. Unlicensed Personal Communication Service Devices for Asynchronous Operation in the 2390-2400 and 2402-2417 MHz Bands

Cornell generally supports the Part 15 allocation for asynchronous operation devices in the 2390-2400 MHz band. Given the power limitations on such devices, their terrrestial use is not likely to interfere with radar operations at the Arecibo Observatory unless these devices are relatively close to the Observatory. However, Cornell is concerned about spurious and out-of-band emissions from such devices, and ultimately, the best protection for the Arecibo operations comes from modifications of the service rules applied to this band.

Cornell supports the Commission's plan to use the service rules from the asynchronous service band at 1910-1920 MHz for the 2390-2400 MHz band. Cornell would further suggest reconsidering the operation standards within those service rules with regard to out-of-band and spurious emissions. A dialogue between interested parties on tightening such standards will benefit all users of these bands.

Notwithstanding the above discussion, Cornell agrees with the Commission's decision to ban aeronautical use of such devices. The radar operations at Arecibo are considerably more vulnerable to emissions from aeronautical devices with clear line of sight than to ground based service.

Cornell remains concerned about the use of Part 15 devices in outdoor point-to-point data links operating in the vicinity of the Observatory[2]. Such operations could send signals into the horizon, causing harm similar to that of the aeronautical uses. Accordingly, Cornell requests that the Commission modify Section 15.321 of the Rules to provide that such devices are not operated in a manner that interferes with the operations at Arecibo, and that any fixed user of such devices within 10 miles from the Arecibo Observatory[3] must first coordinate such operations with the Observatory.

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[2]Most planetary radar observations have a harmful interference limit similar to VLBI at -210 dBW/m^2/Hz near this frequency (ITU.R-R.769). According to the 1920-1930 MHz Asynchronous service rules (section 15.321 of the Commission's Rules), a 100 mW system with 1 MHz bandwidth at 10 kilometers distance and with direct line of sight may legally produce signals at 1.25 MHz below the 2390 MHz band edge of -210 dBW/m^2/Hz. The 6 dB gain permitted under the rules may therefore harmful interference if directed at toward the Observatory from this distance.

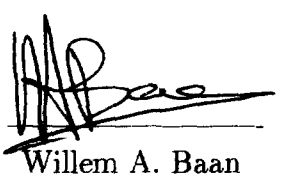
[3]The coordinates of the Arecibo Observatory are 18^o 20' 46" North Latitude and 66^o 45' 11" West Longitude.

IV. Conclusions

The proposed terrestial uses of the 2390-2400 and 2402-2417 MHz bands are unlikely to cause serious problems for planetary radar operations at the Arecibo Observatory, unless such PCS operations are relatively close to the Observatory. Cornell supports the prohibition on aeronautical uses, since such uses could substantially harm Arecibo operations. In addition, Cornell recommends modification of the Part 15 rules to limit interference from point-to-point PCS operations in the vicinity of the Observatory. Lastly, Cornell recommends review of the Part 15 service rules in the 2390-2400 MHz band with regard to out-of-band and spurious emission. Tightening these standards will benefit all users of the band.

Respectfully submitted,

CORNELL UNIVERSITY

By: 

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